

**BEFORE  
THE PUBLIC SERVICE COMMISSION OF  
SOUTH CAROLINA**

**DOCKET NO. 2018-319-E**

IN THE MATTER OF:

Application of Duke Energy Carolinas, LLC )	<b>DIRECT TESTIMONY OF</b>
For Adjustments in Electric Rate Schedules )	<b>JON F. KERIN</b>
and Tariffs )	<b>FOR DUKE ENERGY</b>
)	<b>CAROLINAS, LLC</b>

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**I.     INTRODUCTION**

**Q.     PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT POSITION.**

A.     My name is Jon F. Kerin. My business address is 411 Fayetteville Street, Raleigh, North Carolina, 27601-1849. I am employed by Duke Energy Business Services, LLC, as Vice President, Coal Combustion Products (“CCP”) Operations, Maintenance and Governance. In this docket, I am testifying on behalf of Duke Energy Carolinas, LLC (“DE Carolinas” or the “Company”). As more fully discussed below, my responsibilities have included providing governance and operations leadership to Duke Energy Corporation’s (“Duke Energy”) regulated operating companies, including DE Carolinas. Relevant to this testimony, during 2014, I held the position of General Manager in the Ash Basin Strategic Action Team – referred to as “ABSAT.” I was named to my current role in 2015. In July 2018, I assumed additional responsibilities in the CCP organization, taking on responsibility for the Operations and Maintenance division.

**Q.     PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.**

A.     I have a Bachelor of Science degree from the University of Maryland. I have over 30 years of experience in the electric utility industry, where I have been involved in various complex and challenging projects. In addition to my CCP experience, my background includes experience at various nuclear electric generating power plants and in other corporate functions. Prior to the merger of Progress Energy, Inc. and Duke Energy, I was the Director of the Project Management Center of

1 Excellence for Progress Energy, Inc. After the merger, I became General  
2 Manager, Performance Improvement in the Project Management and Construction  
3 Department before transitioning to the ABSAT team. In these roles, I worked  
4 with new project implementation and construction teams to ensure that major  
5 compliance projects and major construction projects were planned, executed, and  
6 completed in a reasonable, prudent, and cost-effective manner as required by  
7 regulatory bodies in Duke Energy's regulated jurisdictions. In these roles, I  
8 worked on and provided advice and leadership to over a dozen major projects  
9 with combined costs exceeding \$5 billion. I also led efforts to develop and  
10 establish enterprise-wide procedures to ensure all regulated projects were  
11 completed in a prudent and cost-effective manner.

12 **Q. WHAT WAS THE PURPOSE OF THE ASH BASIN STRATEGIC ACTION**  
13 **TEAM?**

14 A. The ABSAT team was the umbrella organization created for Duke Energy  
15 companies to address the laws, regulations, and orders concerning the  
16 management of coal combustion residuals ("CCR").<sup>1</sup> These new compliance  
17 requirements apply to electric generating sites with new and existing CCR  
18 landfills and surface impoundments (collectively "CCR units"), and impose new  
19 obligations regarding landfill design, structural integrity design and assessment  
20 criteria for CCR basins, groundwater monitoring and protection procedures,  
21 closure of impoundments, and operational and reporting procedures for the

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<sup>1</sup> CCR refers to fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities. 40 C.F.R. § 257.53.

1 disposal and management of CCR. This work has now been absorbed into the  
2 CCP organization.

3 During my work on the ABSAT team, I spent approximately 3,000 hours  
4 working exclusively on CCR issues. During this time, I reviewed and became  
5 familiar with relevant state and federal regulations dealing with CCR issues as  
6 detailed further in my testimony and as set out in Kerin Exhibit 1. I also studied  
7 and became knowledgeable on historical industry practices and standards to  
8 comply with these regulations. As part of this process, I interviewed legacy  
9 employees in Fossil Hydro Operations, Environmental Health and Safety, and  
10 Central Engineering who worked at, and with, coal combustion generating units  
11 and CCR handling sites. I reviewed historical company documents dealing with  
12 these facilities and sites to gain an understanding of how CCR handling standards  
13 inside and outside of the Company have developed over time. I also interviewed  
14 legacy employees at other Southeast utilities including Dominion Energy, AEP,  
15 TVA, and Southern Company.

16 As part of my duties on the ABSAT team, I toured and inspected every  
17 CCR basin in Duke Energy's North and South Carolina jurisdictions. I also  
18 toured and examined other CCR units at Duke Energy's Midwest sites, and  
19 Dominion Energy, AEP, TVA, and Southern Company sites. During my tenure on  
20 the ABSAT team, I developed CCR evaluations for each of Duke Energy's CCR  
21 sites and, where applicable, worked on developing comprehensive work plans  
22 when work was needed on any of those sites. In the course of my duties, I also  
23 interfaced with other utilities to discuss and enhance mutual understandings on

1 evolving industry standards relating to CCR issues, and shared and received best  
2 practices across the electric industry. I developed an industry peer group to  
3 discuss CCR issues, which meets semi-annually and includes companies such as  
4 Dominion and Southern Company. In this capacity, I also gained an  
5 understanding and knowledge of coal ash management practices at utilities across  
6 the country.

7 **Q. WHAT ARE YOUR PRIMARY RESPONSIBILITIES AS THE VICE**  
8 **PRESIDENT, OPERATIONS, MAINTENANCE, AND GOVERNANCE?**

9 A. I am responsible for regulatory affairs, operations support, and other centralized  
10 CCR functions. My team works to define, establish, and maintain fleet CCP  
11 standards, programs, processes, and best practices within functional areas for all  
12 fossil plant sites. My team also oversees site operations and maintenance  
13 (“O&M”) of CCP facilities, including CCR and high-hazard dam operations and  
14 maintenance, production landfills, decommissioning and demolition, and  
15 byproducts management.

16 In my current role, virtually 100 percent of my time is dedicated to CCR  
17 oversight, compliance, operations, maintenance, and project execution activities.  
18 I have continued to review and study evolving rules and regulations related to  
19 CCR issues. I have also maintained my presence in industry peer groups  
20 regarding CCR issues and continue to help monitor, develop, and implement  
21 industry best practices and standards for CCR issues.

1   **Q.   HAVE YOU EVER TESTIFIED BEFORE A REGULATORY BODY?**

2   A.   Yes. I filed direct testimony regarding CCR issues in Duke Energy Progress,  
3       LLC's ("DE Progress") rate case in South Carolina in Docket 2016-227-E and  
4       appeared before the Public Service Commission of South Carolina in October  
5       2016 in connection with that case. I also filed direct and rebuttal testimony  
6       regarding CCR issues in DE Progress' and DE Carolinas' recent North Carolina  
7       rate cases in Docket Nos. E-2, Sub 1142 and E-7, Sub 1146, respectively, and  
8       testified before the North Carolina Utilities Commission in connection with those  
9       cases.

10   **Q.   WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

11   A.   DE Carolinas is seeking recovery of CCR expenses incurred from January 2015  
12       through August 2018 and estimated costs to be incurred September 2018 through  
13       December 2018 related to compliance with applicable regulatory requirements.  
14       The purpose of my testimony is to explain those regulatory requirements and to  
15       explain how our compliance actions and decisions, including our current plans to  
16       meet existing legal requirements, have been and continue to be reasonable,  
17       prudent, and cost-effective approaches to comply with those regulatory  
18       requirements.

19   **Q.   PLEASE BRIEFLY SUMMARIZE YOUR TESTIMONY.**

20   A.   DE Carolinas has become subject to both federal and state regulatory  
21       requirements that mandate closure of its ash basins and other ash storage areas.  
22       Since the early 1900s, DE Carolinas has disposed of CCR in compliance with  
23       then-current regulatory requirements and industry practices. Until the 1950s,

1 CCR were either emitted through, in the case of fly ash, smokestacks or, in the  
2 case of bottom ash, manually removed from boilers and stored in fill areas. Since  
3 that time, the industry transitioned to wet sluicing using water to remove ash from  
4 boilers, and to clean the electrostatic precipitators (“ESP”), preventing ash from  
5 being emitted through the smokestacks. This effluent, as well as flue gas  
6 desulfurization (“FGD”) blowdown, was then diverted to ash basins, or  
7 impoundments. DE Carolinas has 17 ash basins in the Carolinas.

8 In the mid-1970s, the enactment of the Clean Air Act (42 United States  
9 Code §7401 et seq.) and its subsequent amendment in the 1990s required electric  
10 utilities to capture more CCR through the use of ESP or bag houses and FGD  
11 blowdown. The Clean Water Act of 1972 (33 United States Code §1251 et seq.),  
12 and the subsequent creation of the National Pollutant Discharge Elimination  
13 System (“NPDES”) permitting system, made wet ash handling and ash basins the  
14 primary lawful and effective way to meet CCR needs and environmental  
15 regulatory requirements from 1974 until 2015.

16 In June 2010, the United States Environmental Protection Agency (“EPA”)  
17 proposed national minimum criteria to regulate the disposal of CCR and the  
18 operation and closure of active CCR landfills and existing and inactive CCR  
19 surface impoundments. Approximately five years later, EPA published the final  
20 CCR Rule in the Federal Register in April 2015.

21 In South Carolina, DE Carolinas entered into a Consent Agreement with  
22 the South Carolina Department of Health and Environmental Control  
23 (“SCDHEC”) in September 2014. Pursuant to this agreement, DE Carolinas

1       agreed to excavate its ash basins and ash storage areas at the W.S. Lee Steam  
2       Station in Anderson County, South Carolina. It should be noted that other South  
3       Carolina utilities are closing their ash basins in a similar fashion and also pursuant  
4       to Consent Agreements with and approval from SCDHEC.

5               Also, in 2014, the state of North Carolina enacted the Coal Ash  
6       Management Act of 2014 (“CAMA”), which requires that all ash basins in North  
7       Carolina be closed, either through excavation or via the cap-in-place method. In  
8       many respects, CAMA mirrors the federal CCR Rule.

9               All of DE Carolinas’ ash basins must be closed under the CCR Rule,  
10      South Carolina regulatory oversight, and/or CAMA. The Company has begun the  
11      process of closing, or submitting plans to close, its ash basins in accordance with  
12      the program with the most restrictive requirements. There is a great deal of  
13      duplication and interaction between the CCR Rule and state regulatory  
14      requirements. As I explain below in my testimony, many of the actions Duke  
15      Energy will take will serve multiple compliance purposes. In fact, many actions  
16      and draft rules applicable to many utilities, not just Duke Energy, were already  
17      being developed prior to 2014, and we are now in another wave of evolution in  
18      environmental regulation pertaining to ash. *See* Kerin Exhibit 2. In response to  
19      these new requirements addressing CCR disposal activities, the Company is  
20      adding dry fly ash, bottom ash, and FGD blowdown handling systems to  
21      operating coal-fired plants that are not already so equipped. The Company is also  
22      modifying all active and decommissioned plants to divert storm water and low-  
23      volume wastewater away from the basins.

1           Accordingly, the Company is requesting recovery of the incremental  
2           compliance costs related to coal ash pond closures incurred starting January 2015  
3           through August 2018 and expected compliance costs from September 2018  
4           through December 2018 as explained in more detail by Company Witness Smith.  
5           My testimony and exhibits demonstrate that both these incurred and expected  
6           compliance costs are reasonable, prudent, and cost-effective given the individual  
7           facts and circumstances at each power plant and ash basin site at issue.<sup>2</sup>

8   **Q.   HOW IS YOUR TESTIMONY ORGANIZED?**

9   A.   In this Section I, I have provided information concerning my background and the  
10       purpose of my testimony. In Section II, I provide an overview of the generation  
11       resources, including coal-fired generation, that the Company has used to reliably  
12       and efficiently serve customers for over 100 years of its existence. I explain that  
13       CCR are the natural byproduct of burning coal to generate electricity. I discuss  
14       the Company's past practices for the storage and disposal of CCR, and I explain  
15       that its practices have been in accordance with the electric power industry's  
16       prudent standards and applicable laws, regulations, and permit requirements as  
17       they have existed over time. In Section III, I discuss the new requirements  
18       imposed on the Company under the new CCR compliance requirements. In  
19       Section IV, I discuss the Company's plans to comply with the CCR compliance  
20       requirements, the required regulatory approvals and permits for DE Carolinas'  
21       compliance plans, including timing and implementation issues, and costs incurred  
22       to date and expected over the next several years. I also explain and demonstrate

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<sup>2</sup> This case excludes any fines or penalties incurred by DE Carolinas related to ash basin closure or management.

1           how each of the Company's historical and ongoing CCR compliance costs are  
2           reasonable, prudent, and cost-effective given the individual facts and  
3           circumstances at each power plant and ash basin site at issue.

4   **Q.   ARE YOU PROVIDING ANY EXHIBITS WITH YOUR TESTIMONY?**

5   A.   Yes, I have attached 10 total exhibits, described below, as well as an appendix:

6           Kerin Exhibit 1: Statutes and Regulations (listing of relevant coal ash  
7           environmental regulations);

8           Kerin Exhibit 2: CCR Rule (text of the Federal CCR Rule);

9           Kerin Exhibit 3: Site Locations NC and SC (map of coal ash facilities);

10          Kerin Exhibit 4: Site Facts (site-specific background information);

11          Kerin Exhibit 5: Ash Basin Information (site-specific information about ash units)

12          Kerin Exhibit 6: Responses to Rule Changes Through the Decades DEC  
13          (summary of DE Carolinas' compliance with evolving environmental  
14          regulations);

15          Kerin Exhibit 7: Beneficiation Year 2015 thru August 2018 (summary of  
16          beneficiation at DE Carolinas Sites);

17          Kerin Exhibit 8: Graphics Cap-in-Place and Landfill (graphical depiction of cap-  
18          in-place and landfill closure methodologies);

19          Kerin Exhibit 9: Closure Plans (site-specific closure plans and engineering  
20          reports); and

21          Kerin Exhibit 10: Components of 2015-2018 Recovery Request (summary of  
22          costs and regulatory drivers relevant to DE Carolinas' application).

1                   **II.     DE CAROLINAS' GENERATION RESOURCES**

2   **Q.     PLEASE PROVIDE AN OVERVIEW OF THE COMPANY'S ELECTRIC**  
3   **GENERATION ASSETS.**

4   A.     DE Carolinas has provided reliable electric generation for decades to its  
5           wholesale and retail customers in South Carolina and North Carolina from a  
6           diverse portfolio of generating assets including those that generate electricity  
7           using coal, nuclear fuels, natural gas, hydro flows, and solar photovoltaic energy  
8           sources. Until recently, coal has been the historic "go-to" fuel choice for base-  
9           load, least-cost reliable service. Accordingly, in South Carolina and North  
10          Carolina, DE Carolinas has operated eight coal-fired generating facilities with  
11          CCR units that contain historically produced CCR directly resulting from the coal  
12          combustion process. These eight coal-fired DE Carolinas generating facilities  
13          have 17 CCR basins that date back to the 1950s and were an integral part of  
14          historical coal-fired power generation at these sites.

15 **Q.     WHAT IS THE CURRENT STATUS OF THE COMPANY'S COAL-FIRED**  
16 **GENERATING FACILITIES?**

17 A.     Of the eight coal-fired DE Carolinas generating facilities with ash basins, coal-  
18          powered electric generation has ceased at four of these stations, including the Dan  
19          River, Buck, Riverbend, and W.S. Lee plants. Refer to Kerin Exhibit 3 for the  
20          geographical location of the eight coal-fired generating facilities with ash basins  
21          in the DE Carolinas service territory.

1   **Q.     WHAT ARE COAL COMBUSTION RESIDUALS?**

2   A.     CCR are byproducts produced from the burning of coal in coal-fired power  
3           generation plants and include fly ash, bottom ash, boiler slag, and FGD material.  
4           Fly ash and bottom ash are direct byproducts of the coal combustion process. Fly  
5           ash is a very fine, powdery material composed mostly of silica produced from the  
6           burning of finely ground coal in the boiler. Bottom ash is a coarse, angular ash  
7           particle that is too large to be carried up into the smoke stacks, so it forms in the  
8           bottom of the coal furnace. Bottom ash makes up approximately 15 percent of the  
9           total ash produced. In the early years of operation, bottom ash was manually  
10          collected at the bottom of the boiler, and then transported to an ash storage  
11          location. Later, the industry utilized a water sluice process to efficiently transport  
12          the bottom ash to ash storage basins. In the early years, fly ash went directly out  
13          the smoke stack. The industry later employed collection of the fly ash using  
14          electrostatic precipitators and bag houses in order to improve air emissions, where  
15          the ash was then efficiently water sluiced to an ash basin. As I explain above, DE  
16          Carolinas' coal-fired generation facilities either have been or are being modified  
17          to incorporate dry fly ash and/or dry bottom ash handling. Additional CCR flow  
18          in the form of wastewater is produced by the operation of FGD systems at specific  
19          operating coal-fired sites. All of the types of CCR mentioned above are  
20          byproducts of the electricity production process lifecycle at coal-fired generation  
21          plants.

1   **Q.   PLEASE PROVIDE A HISTORY OF DE CAROLINAS' ELECTRIC**  
2       **GENERATION RELYING ON COAL AS THE FUEL SOURCE.**

3   A.   The Company's electric power generation from burning coal dates back to the  
4       Greenville Steam Station, Duke Power's first coal-fired fossil plant, which was  
5       completed and placed in service in Greenville, South Carolina, to supply standby  
6       and peak-load electricity on April 1, 1911. Kerin Exhibit 4 provides details  
7       regarding the commercial operation date, generation capacity (megawatts or  
8       MW), and retirement date, if applicable, for the eight DE Carolinas coal-fired  
9       generating stations with ash basins in the Carolinas.

10           All of these coal plants produced CCR, fly ash, and bottom ash, as direct  
11       byproducts of the coal combustion process. In the 1950s the electric utility  
12       industry began to efficiently transport bottom ash by water sluicing to constructed  
13       surface impoundments, which we commonly refer to as ash basins. Some of DE  
14       Carolinas' older ash basins include the 1956 primary ash basin at the Dan River  
15       Plant and the 1957 ash basins at the Allen, Buck, Riverbend and Cliffside plants.  
16       Kerin Exhibit 5 provides details regarding when DE Carolinas' ash basins were  
17       constructed, their estimated content of ash in tons, and when they were taken out  
18       of service, if applicable. The CCR contained in these basins represent the  
19       byproduct of decades of reliable coal-fired generation at these sites and a process  
20       step in the electricity generation life cycle.

1   **Q.   HOW HAVE ENVIRONMENTAL COMPLIANCE OBLIGATIONS**  
2   **RELATED TO CCR MANAGEMENT EVOLVED OVER TIME?**

3   A.   Environmental regulations related to CCR management have evolved  
4       significantly over time, affecting how the Company has operated its coal-fired  
5       stations in compliance with new and evolving environmental obligations. At each  
6       step in the environmental regulatory evolution process, DE Carolinas was in line  
7       with industry standards and reasonably and prudently managed CCRs and its coal  
8       ash basins.

9               Before the Clean Air Act was amended in 1970, the only type of CCRs  
10       collected at the Company's plants was bottom ash. Bottom ash was sometimes  
11       stored in basins and sometimes placed dry on the land surface in "lay of land"  
12       areas, which was lawful at the time. After new Clean Air Act requirements were  
13       put in place, the utility industry, including DE Carolinas, added electrostatic  
14       precipitators to coal-fired plants in the 1970s to reduce air emissions of fly ash.  
15       The collection of fly ash significantly increased the volume of CCR being handled  
16       at the plants, giving rise to the need for larger basins and ash handling systems.  
17       Additionally, since the 1990 Clean Air Act amendments, a greater emphasis on  
18       sulfur emissions control has prompted many coal burning power plants to install  
19       FGD units (also known as "scrubbers"). FGD scrubbers generate byproducts,  
20       primarily gypsum, which are classified as a type of CCR.

21              In 1972, the Federal Water Pollution Control Act, now known as the Clean  
22       Water Act ("CWA"), was amended to provide a new comprehensive program for  
23       regulating discharge of pollutants into the waters of the United States and

1 regulating quality standards for surface waters. The CWA resulted in the  
2 establishment of a systematic permit system to monitor water quality and to  
3 provide specific limits for the flow and content of process water leaving these ash  
4 basins. Many of the Company's ash basins (at least one at each power plant) were  
5 operating before the passage of the CWA amendments in 1972, which created the  
6 NPDES permitting program. These plants subsequently received NPDES permits  
7 from South Carolina and North Carolina after the states received authority from  
8 the EPA to issue permits.

9 In accordance with the CWA, the EPA promulgated Effluent Limitations  
10 Guidelines ("ELGs") for the Steam Electric Power Generating industry category  
11 in 1974. The Development Document for the 1974 rule states that most coal-fired  
12 plants across the industry used wet ash handling and ash basins for treatment of  
13 ash handling wastewater, although some plants employed other methods for site-  
14 specific reasons, such as space constraints. In the 1974 rule, the EPA set limits  
15 based on Best Practicable Control Technology Currently Available ("BPT") and  
16 Best Available Technology Economically Achievable ("BAT") for fly ash  
17 transport water and bottom ash transport water. In both cases, the limits were  
18 based on the use of wet ash handling and treatment in ash basins. In 1982, the  
19 EPA withdrew the BAT limitations on fly ash transport water and left the limits on  
20 bottom ash transport water unchanged.<sup>3</sup> The ELGs for the Steam Electric Power  
21 Generating category were not amended again until 2015. As a result, from 1974  
22 to 2015, ash basins were a lawful and effective way of meeting the wastewater

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<sup>3</sup> The rule did prohibit the discharge of fly ash transport water at new facilities.

1 treatment requirements under the CWA. In 2015, the EPA finalized new ELGs  
2 that adopted a zero discharge requirement for both fly ash and bottom ash  
3 transport water at existing facilities. Meeting these limits effectively requires  
4 converting to dry ash handling or ceasing plant operations.

5 Before 2015, CCRs were not regulated under the Resource Conservation  
6 and Recovery Act ("RCRA"). CCRs are classified under RCRA as a "special  
7 waste." Under RCRA § 3001(b)(3)(A) (known as the Bevill Amendment), fossil  
8 fuel combustion waste and several other waste categories were initially exempt  
9 from regulation as hazardous waste under RCRA Subtitle C. The EPA was  
10 required to assess fossil fuel combustion waste and the other types of exempted  
11 waste and submit a formal report to Congress on its findings. The EPA was then  
12 required to make a final regulatory determination as to whether the special waste  
13 should be regulated as a hazardous waste. The EPA published rules in 1993 and  
14 2000 concluding that CCR should not be regulated as hazardous waste. On  
15 December 22, 2008, a large coal ash spill occurred at the TVA power plant in  
16 Kingston, Tennessee. While this event prompted the industry to take note of the  
17 causes for the TVA spill from an operational perspective, the event also prompted  
18 the EPA to revisit its determination regarding CCR. On June 21, 2010, the EPA  
19 proposed regulations under RCRA to address the risks from the disposal of CCR  
20 generated from the combustion of coal at electric utilities and independent power  
21 producers. This proposal contained three regulatory options. Under the first, the  
22 EPA proposed to list CCR as special wastes subject to regulation under Subtitle C  
23 (hazardous waste) of RCRA when they are destined for disposal in landfills or

1 surface impoundments. Under the other two options, the EPA proposed to  
2 regulate disposal of such materials under Subtitle D (non-hazardous waste) of  
3 RCRA by issuing national minimum criteria. Because the proposals were very  
4 different, it was difficult for the utility industry, including the Company, to predict  
5 the timing and methods that would be required under the new rule for closing ash  
6 basins. The rule was not finalized until 2015, when the EPA announced its  
7 selection of the Sub-Title D option, regulating CCR as non-hazardous waste.  
8 Additional details about the CCR Rule are set out below.

9 Before the CCR Rule, CCR management was regulated under state laws  
10 by statutes and regulations dealing with water quality protection and solid waste  
11 management. Ash basins were regulated through dam safety regulations and  
12 NPDES permits. Use of ash removed from ash basins was regulated by rules for  
13 distribution of residual wastewater solids, which required a permit for the use of  
14 removed ash. Construction and operation of landfills were governed by solid  
15 waste rules, and beneficial use of dry ash for structural fill was regulated by  
16 provisions of the solid waste rules.

17 As noted above, in September 2014 the Company entered into the W.S.  
18 Lee Consent Agreement (“Consent Agreement”) with SCDHEC, which addressed  
19 future ash management at the W.S. Lee Plant. The Consent Agreement requires  
20 DE Carolinas to excavate ash from the Inactive Ash Basin, the Ash Fill Area, and  
21 any other areas where ash may have potentially migrated from these sites and  
22 dispose of the ash in an onsite landfill. Excavation of the Inactive Ash Basin and

1 Ash Fill Area is in addition to the Company's decision pursuant to the CCR Rule  
2 to excavate ash from the W.S. Lee Plant's Primary and Secondary Ash Basins.

3 In 2014, the North Carolina General Assembly passed CAMA, which,  
4 among other things, requires the closure of ash basins in North Carolina according  
5 to a defined schedule and methodology.

6 Compliance with each phase of new environmental regulatory  
7 requirements that I have discussed required DE Carolinas to modify its operations  
8 and incur additional expenditures. Kerin Exhibit 6 graphically depicts how these  
9 regulations and requirements changed over time and how DE Carolinas  
10 reasonably and prudently responded to each of those changes.

11 **Q. HOW DID THESE EVOLUTIONS IN ENVIRONMENTAL OBLIGATIONS**  
12 **IMPACT CCR PRODUCTION AND STORAGE AT THE COMPANY'S**  
13 **COAL-FIRED GENERATION FACILITIES?**

14 A. Both the volume and characteristics of CCR managed at the Company's facilities  
15 have changed in response to changes in air emissions control requirements,  
16 beginning with the use of electrostatic precipitators to capture fly ash. As the  
17 coal-fired generating plants addressed evolving air emissions requirements,  
18 modifications such as the addition of selective catalytic reduction equipment to  
19 control emissions of nitrogen oxides and FGD systems to control sulfur dioxide  
20 were made to many of DE Carolinas' coal-fired generating plants. The addition  
21 of FGD systems affected the existing ash basins by directing FGD blowdown  
22 flow to the CCR basins, which represented a new additional CCR flow. At certain  
23 sites, such as at the Marshall Plant, newly-constructed engineered wetlands were

1 built within the footprints of the CCR basins to process the FGD blowdown flow.  
2 At Allen and Belews Creek, bio-reactor systems were installed to process the new  
3 CCR flows. Further, as a result of new FGD systems being added, limestone pile  
4 run-off flows and gypsum pile run-off flows were typically also directed to the  
5 existing ash basins.

6 Consistent with the rest of the industry, as recognized by the EPA in its  
7 ELGs, the Company has relied primarily on ash basins to treat these waste  
8 streams, at least as a final step. The ash basins have been effective at treating  
9 wastewater to meet NPDES permit limits. In the absence of any regulatory  
10 directive to do so, the Company reasonably did not pursue and should not have  
11 pursued regulatory closure or retrofitting for any site that was still generating ash  
12 and that maintained its NPDES permit. However, the South Carolina Consent  
13 Agreements in 2014 established a new set of procedures for closure plans for  
14 plants in South Carolina. In compliance with the CCR Rule and state regulatory  
15 requirements, the Company has now prepared closure plans or site analysis and  
16 removal plans, as applicable, for all of its ash basins.

17 Historically, the Company has invested in conversion to dry ash handling  
18 at certain plants when it was called for by site-specific conditions. Following the  
19 promulgation of the CCR Rule and passage of CAMA, however, the Company is  
20 converting to full dry ash handling at all operating plants as required by those  
21 requirements and as the only viable alternative to plant closure. This involves  
22 both installing new equipment and securing disposal capacity. The ash basins are  
23 a part of the coal-fired generation process at the sites and provide dilution,

1 settling, and/or retention functions for other power plant process water flows,  
2 such as low volume wastewater, coal pile run-off, landfill leachate, and FGD  
3 wastewater. Additionally, all plant discharges will be rerouted away from ash  
4 basins at retired and active sites.

5 DE Carolinas has also historically pursued opportunities to sell ash for  
6 beneficial reuse and will continue to do so as feasible. As the regulatory  
7 requirements for ash reuse tightened, the Company limited its sale of ash to  
8 situations in which compliance could be carefully monitored and to encapsulated  
9 uses.

10 In summary, beyond the storage of fly ash and/or bottom ash, the operation  
11 of ash basins has historically evolved to accept new CCR flows resulting from  
12 FGD modifications required to address air emissions and also to accept other non-  
13 CCR process flows, such as coal pile run-off and low volume wastewater. The  
14 construction and use of the ash basins is the final step in the generation process  
15 that has resulted in reliable, efficient, coal-fired electricity in the Carolinas for  
16 many decades.

17 **Q. IS THERE ANY FUTURE FOR BENEFICIAL REUSE OF CCRs?**

18 A. Yes. As referenced above, Duke Energy has endeavored across its coal-fired  
19 generating fleet to maximize the beneficial use of production ash and to reclaim,  
20 where possible, stored ash for sale for beneficial use. Ash beneficiation for DE  
21 Carolinas began in 1986/1987 at Belews Creek, selling ash for the cement  
22 industry. From January 2016 through August 2018, 38 percent of the DE  
23 Carolinas fleet production ash, or approximately 903,000 tons, was sold for

1 beneficial reuse to produce products such as a replacement for Portland Cement,  
2 bricks, and blocks. It should be noted that the beneficial uses of ash for products  
3 are limited based on the quality of the ash produced or stored, particularly the  
4 carbon content, and the regional market demand. Also, beneficial use  
5 opportunities as a structural fill are limited based on specific regional projects that  
6 are in need and by statutory and regulatory requirements. Please refer to Kerin  
7 Exhibit 7 for details on sales for beneficial use of production ash and stored ash in  
8 the Carolinas.

9 **Q. WERE AND ARE THE COMPANY'S CCR HANDLING PRACTICES IN**  
10 **ACCORDANCE WITH INDUSTRY PRACTICE AND REGULATORY**  
11 **REQUIREMENTS?**

12 A. Yes. In 1988, the EPA submitted its Report to Congress on Wastes from the  
13 Combustion of Coal by Electric Utility Power Plants ("1988 Report"). The 1988  
14 Report is a comprehensive assessment of the electric utility industry's use of coal  
15 and management of CCR up to that point in history. The 1988 Report found that  
16 80 percent of CCR in the industry was being treated and stored in surface  
17 impoundments or disposed of in landfills. Of those units, only 40 percent were  
18 lined, either with a synthetic, clay, or composite liner. Historically, surface  
19 impoundments were the single most widely used treatment and storage method  
20 for CCR. At the time of the 1988 Report, landfilling of CCR was increasingly  
21 common. As of 1988, Duke Energy was employing both surface impoundments  
22 and landfills, which the 1988 Report noted were the most commonly used types of  
23 treatment, storage, and disposal units used by the industry.

1           In the preamble to the CCR Rule, the EPA provided an updated assessment  
2       of the coal-fired electric power industry. The CCR Rule details that in 2012  
3       alone, over 470 coal-fired electric generating facilities burned over 800 million  
4       tons of coal, generating approximately 110 million tons of CCR in 47 states and  
5       Puerto Rico. In 2012, approximately 40 percent of the CCR generated were  
6       beneficially used, with the remaining 60 percent treated and stored in CCR  
7       surface impoundments; of that 60 percent, approximately 80 percent was stored in  
8       onsite basins and landfills. Across the United States, CCR disposal currently  
9       occurs at over 310 active onsite landfills, averaging over 120 acres in size with an  
10      average depth of 40 feet and at over 375 active onsite surface impoundments.  
11      Stated differently, the Company is re-using (selling) and storing CCR in the same  
12      manner and at approximately the same percentages as the coal-fired utility  
13      industry's national averages. Duke Energy's practices have been and continue to  
14      be consistent with those of the industry.

15           Similar to the industry, DE Carolinas has onsite CCR landfills that are  
16      actively receiving production fly ash and some bottom ash, at specific coal-fired  
17      generating sites, including the Allen, Belews Creek, Cliffside and Marshall Plants  
18      in the Carolinas. Also similar to the industry, DE Carolinas has active ash basins  
19      that will receive bottom ash, and some fly ash, at specific coal-fired generating  
20      sites through first quarter 2019. These sites include the Allen, Belews Creek,  
21      Cliffside and Marshall Plants in the Carolinas. The ash handling practices for ash  
22      basins and ash landfills in the Carolinas are consistent with the applicable  
23      regulatory requirements that were in effect during the history of these CCR units.

1   **Q.    ARE THE COMPANY’S CCR STORAGE AND HANDLING PRACTICES**  
2       **CONSISTENT WITH THE PRACTICES OF OTHER DUKE ENERGY**  
3       **AFFILIATES?**

4    A.    Yes. The Company’s CCR storage and handling practices are consistent across  
5       the Duke Energy fleet, including coal generation located in Florida and in the  
6       Midwest. Duke Energy as it exists today has been formed over the years through  
7       the mergers of several utilities with independently operated coal-fired generation,  
8       including the Cinergy Corporation in 2006 and Progress Energy, Inc. in 2012.  
9       Indeed, going farther back in time, Progress Energy, Inc. was created in 2000  
10      from the merger of legacy utilities Carolina Power & Light (“CP&L”) and Florida  
11      Power Corporation (“FPC”). Similarly, Cinergy Corporation was created in 1994  
12      by the merger of legacy utilities Public Service Indiana (“PSI”) and Cincinnati  
13      Gas & Electric Company (“CG&E”). Yet, the historical and current CCR  
14      handling and use of CCR units is consistent across all of these legacy companies  
15      that make up Duke Energy today, and consistent with the industry.

16       **III.    NEW REQUIREMENTS REGARDING CCR AND ASH BASINS**

17   **Q.    PLEASE DESCRIBE THE CCR COAL ASH REGULATORY**  
18       **REQUIREMENTS.**

19   A.    The CCR compliance requirements described below represent new regulatory  
20       requirements that have significantly changed the operation and life cycle of the  
21       onsite ash basins and ash landfills. The Company must comply with the CCR  
22       Rule, South Carolina coal ash Consent Agreements and closure plans, CAMA in  
23       North Carolina, and other agreements and court orders concerning the

1 management and disposal of CCR, operation and closure of CCR units, and  
2 corrective action and post-closure care.

3 **Q. PLEASE SUMMARIZE THE MAJOR REQUIREMENTS UNDER THE**  
4 **CCR RULE.**

5 A. The purpose of the CCR Rule is to protect groundwater and water quality near  
6 CCR units and ensure stability of those units. The EPA's final CCR Rule  
7 established national minimum criteria for CCR landfills and surface  
8 impoundments that consist of: (1) location restrictions; (2) design and operating  
9 criteria; (3) groundwater monitoring and corrective action; (4) closure  
10 requirements and post-closure care; (5) recordkeeping; (6) notification; and (7)  
11 Internet posting requirements. These requirements are summarized below, and  
12 they result in different impacts at each CCR unit, depending on site-specific  
13 factors.

14 The CCR Rule requires that new and existing CCR surface impoundments  
15 and new CCR landfills and lateral expansions meet location restrictions for:  
16 (1) placement above the uppermost aquifer; (2) wetlands; (3) fault areas; (4)  
17 seismic impact zones; and (5) unstable areas. If a CCR basin does not meet the  
18 location restrictions, then basin closure is required under the CCR Rule. The  
19 specific location restriction assessments that are most likely to affect the  
20 Company's CCR basins, because of typical geological characteristics and historic  
21 groundwater elevations in the Carolinas, are placement above the uppermost  
22 aquifer and wetlands.

1           The placement above the uppermost aquifer location restriction requires  
2           that existing CCR basins be constructed with a base that is located no less than  
3           1.52 meters (five feet) above the upper limit of the uppermost aquifer or  
4           demonstrate that there will not be an intermittent, recurring, or sustained  
5           hydraulic connection between any portion of the base of the CCR unit and the  
6           uppermost aquifer due to normal fluctuations in groundwater elevations  
7           (including the seasonal high water table).

8           The wetlands location restriction considers whether the CCR unit causes  
9           or contributes to significant degradation to wetlands, and in the event of such  
10          effects, sets out compensatory steps that may be taken to achieve no net loss of  
11          wetlands in order to avoid basin closure.

12          The CCR Rule contains design criteria for new CCR landfills and lateral  
13          extensions and new CCR surface impoundments, as well as structural integrity  
14          criteria for new and existing CCR surface impoundments, including an  
15          assessment of dam safety factors.

16          The CCR Rule contains operating criteria for fugitive dust control, run-on  
17          and run-off controls for landfills, hydraulic capacity requirements for surface  
18          impoundments, and inspection requirements for landfills and surface  
19          impoundments. If the ash basin dam does not achieve the minimum factor of  
20          safety requirements, then ash basin closure is required. The CCR Rule also  
21          contains requirements for the assessment of groundwater impacts from CCR  
22          landfills and surface impoundments. It provides requirements for the assessment  
23          of corrective measures, selection of remedies, and implementation of corrective

1 action programs for identified groundwater impacts. Results of the groundwater  
2 assessment may also require ash basin closure.

3 The CCR Rule contains requirements for how and when CCR basins must  
4 be closed. It provides two alternatives for closure, “closure by leaving ash in  
5 place” and “closure through removal of the CCR,” also referred to as excavation.  
6 In the case of closure by leaving ash in place, commonly referred to as “cap-in-  
7 place,” it provides design criteria for the closure cap system. Post-closure  
8 monitoring requirements are also detailed in the CCR Rule. Lastly, the CCR Rule  
9 requires: specific notifications, such as to state agencies; specific requirements  
10 for record keeping, such as the written operating record; and, also, specific  
11 requirements for posting information on a publicly accessible Internet site.

12 **Q. HOW ARE CCR CLASSIFIED UNDER THE CCR RULE?**

13 A. As stated in the CCR Rule, the EPA considers CCR to be a non-hazardous solid  
14 waste.

15 **Q. HOW IS THE CCR RULE ENFORCED?**

16 A. The CCR Rule was promulgated as a self-implementing rule that could only be  
17 enforced by citizen suit and not by administrative measures. However, the Water  
18 Infrastructure Improvements for the Nation Act (WIIN Act), which was signed  
19 into law in December 2016, gave the EPA immediate direct enforcement  
20 authority, authorizes states to establish permit programs for implementing the  
21 CCR Rule, and requires the EPA to do so, conditioned on federal funding, in those  
22 states that do not adopt a CCR permit program.

1   **Q.    TO WHICH DE CAROLINAS UNITS DOES THE CCR RULE APPLY**  
2       **AND WHY?**

3    A.   Pursuant to Section 257.50(b) of the CCR Rule, the requirements of the CCR  
4       Rule apply to all owners and operators of new and existing landfills and surface  
5       impoundments, including any lateral expansions of such units that dispose or  
6       otherwise engage in solid waste management of CCR generated from the  
7       combustion of coal at electric utilities and independent power producers.  
8       Pursuant to Section 257.50(c), the CCR Rule also applies to inactive CCR surface  
9       impoundments at active electric utilities or independent power producers,  
10      regardless of the fuel currently used at the facility to produce electricity. When  
11      the CCR Rule was promulgated, it contained a provision that excluded “legacy”  
12      impoundments at sites where the utility had ceased producing electricity prior to  
13      October 19, 2015, the effective date of the CCR Rule. *See* Section 257.50(e).  
14      One DE Carolinas coal-fired generating site – the Riverbend Plant – qualified for  
15      exemption under Section 257.50(e). The issue of whether the CCR Rule must  
16      apply to impoundments at power plant sites that have ceased generating electricity  
17      was litigated in the D.C. Circuit Court of Appeals in *Util. Solid Waste Activities*  
18      *Group, et al., v. Env'tl. Prot. Agency*, 901 F. 3d 414 (D.C. Cir. 2018) (“*USWAG v.*  
19      *EPA*”). In that case, environmental petitioners asserted that there was no rational  
20      basis for excluding impoundments at inactive plants given that the CCR Rule  
21      covers inactive impoundments at active facilities and, therefore, impoundments  
22      such as those at the Riverbend Plant must be regulated pursuant to RCRA. In the  
23      recently issued decision, the Court agreed with the position of the environmental

1 petitioners and determined that the EPA's decision to exclude legacy  
2 impoundments from the CCR Rule was "arbitrary and capricious." The EPA is  
3 expected to undertake an expedited rulemaking to bring these legacy  
4 impoundments into the CCR Rule. Accordingly, as a result of the D.C. Circuit  
5 Court of Appeals' decision, the CCR Rule will apply to all DE Carolinas sites.

6 **Q. IN ADDITION TO THE CCR RULE AND CAMA, IS THE COMPANY**  
7 **SUBJECT TO SPECIFIC SOUTH CAROLINA COMPLIANCE**  
8 **OBLIGATIONS CONCERNING THE MANAGEMENT OR**  
9 **REMEDiation OF CCR?**

10 A. Yes. DE Carolinas has other CCR-related obligations that result from South  
11 Carolina environmental regulatory oversight under existing rules and regulations.  
12 As noted above, in September 2014, the Company entered into the W.S. Lee  
13 Consent Agreement with the SCDHEC applicable to ash management at the W.S.  
14 Lee plant. The Consent Agreement requires the Company to excavate ash from  
15 the W.S. Lee Plant's Inactive Ash Basin, the Ash Fill Area, and any other areas  
16 where ash may have potentially migrated from these sites. This is in addition to  
17 the Company's decision pursuant to the CCR Rule to excavate ash from the W.S.  
18 Lee Plant's Primary and Secondary Ash Basins. DE Carolinas will be disposing  
19 most of the ash in a lined CCR landfill. Approximately 1.6 million tons of ash  
20 have been removed from the W.S. Lee Plant to date. Currently, DE Carolinas is in  
21 the process of dewatering the basins in preparation for building the landfill and  
22 resuming excavation activities.

1   **Q.   PLEASE BRIEFLY SUMMARIZE THE MAJOR REQUIREMENTS**  
2       **UNDER CAMA.**

3   A.   CAMA requires closure of all ash basins in North Carolina, with the closure  
4       option and closure deadline driven by a prioritization risk ranking classification  
5       process. CAMA requires that all CCR ash basins be closed by dates ranging from  
6       2019 to 2029. The law requires the cessation of storm water flows to CCR ash  
7       basins and conversion to dry ash handling. Groundwater wells are required along  
8       with monitoring and post-closure maintenance programs. CAMA also requires  
9       that the Company provide permanent water supplies to all homeowners within an  
10      established boundary of the ash basins. Lastly, the Company must install and  
11      operate three ash beneficiation projects capable of annually processing 900,000  
12      tons (300,000 tons from each site) of ash stored within the impoundments at the  
13      site to specifications appropriate for cementitious products.

14   **Q.   HOW IS CAMA ENFORCED?**

15   A.   CAMA implementation in North Carolina is overseen by the Department of  
16      Environmental Quality (“NCDEQ”), which has enforcement authority over  
17      CAMA compliance issues.

18   **Q.   TO WHICH DE CAROLINAS FACILITIES DOES CAMA APPLY?**

19   A.   CAMA applies to all of DE Carolinas’ CCR surface impoundments in North  
20      Carolina located at seven coal-fired generating sites.

1 **Q. SINCE CAMA ONLY APPLIES TO THE COMPANY'S NORTH**  
2 **CAROLINA FACILITIES, HOW IS IT RELEVANT TO THIS SOUTH**  
3 **CAROLINA RATE PROCEEDING?**

4 A. South Carolina customers receive the benefit from electricity generated at DE  
5 Carolinas' South Carolina and North Carolina plants; therefore, South Carolina  
6 customers should also share costs from the generation process of electricity  
7 production in both South Carolina and North Carolina. This issue is addressed in  
8 greater detail in the direct testimony of Company Witness Wright.

9 **Q. DO THE CCR RULE, SOUTH CAROLINA REGULATORY POLICY, AND**  
10 **CAMA REQUIRE CLOSURE OF THE COMPANY'S CCR BASINS?**

11 A. Yes. Under one or a combination of the above-listed federal and state regulatory  
12 regimes, the Company will be required to close all of its CCR basins.

13 **Q. HOW DO THE CCR RULE AND STATE REGULATORY**  
14 **REQUIREMENTS WORK TOGETHER TO ADDRESS MANAGEMENT**  
15 **AND REMEDIATION OF THE COMPANY'S CCR BASINS?**

16 A. The CCR Rule requires DE Carolinas to comply with minimum national criteria,  
17 as well as applicable state laws, in the closure of ash basins. Thus, the CCR Rule  
18 provides overarching requirements pursuant to which each state may set forth  
19 more specific regulations. However, as long as minimum national criteria are  
20 satisfied, the CCR Rule does not specify a particular method for closing ash  
21 basins. Thus, the CCR Rule leaves to the states to approve the method of ash  
22 basin closure, as long as such method meets the timeframes and minimum  
23 requirements set forth in the CCR Rule. In North Carolina, the method of closure

1 required under the CCR Rule will be selected through the process set forth in  
2 CAMA. In addition, CAMA requires the submittal of detailed Corrective Action  
3 Plans (“CAPs”) to NCDEQ to address groundwater impacts. CAMA sets forth  
4 specific closure methods which are consistent with the CCR Rule’s minimum  
5 national criteria for sites deemed intermediate risk. The CCR Rule regulates CCR  
6 landfills in addition to CCR surface impoundments, whereas CAMA only  
7 addresses CCR surface impoundments. Finally, South Carolina has required  
8 utilities to excavate ash storage areas, which are exempt from CCR Rule  
9 applicability because they ceased receiving CCR prior to the effective date of the  
10 rule.

11 **Q. ARE THERE SOME SITES TO WHICH THE CCR RULE APPLIES, BUT**  
12 **NOT TO EACH SPECIFIC CCR BASIN AT THAT SITE?**

13 A. Yes. After the D.C. Circuit Court of Appeal’s ruling in *USWAG v. EPA*, all of DE  
14 Carolinas’ ash basins at its seven North Carolina sites are or soon will be subject  
15 to the CCR Rule; however, the Inactive Ash Basin at the W.S. Lee Plant in South  
16 Carolina is not subject to the CCR Rule because it did not contain liquids as of the  
17 effective date of the CCR Rule. Please refer to Kerin Exhibit 5 for a detailed  
18 breakdown of DE Carolinas’ ash basins in the Carolinas and which ash basins are  
19 subject to the CCR Rule.

1   **Q.   PLEASE EXPLAIN HOW THE COMPANY IS COMPLYING WITH ITS**  
2       **COAL ASH REGULATORY OBLIGATIONS INCLUDING THE CCR**  
3       **RULE, SOUTH CAROLINA OVERSIGHT, AND CAMA.**

4   A.   DE Carolinas has reviewed and inventoried the applicable requirements to  
5       determine the full scope of required actions to be taken by the Company, and the  
6       limitations and/or constraints imposed by some of those requirements. The  
7       Company intends to complete the most restrictive actions by the earliest  
8       applicable due dates across these various compliance regulatory drivers.  
9       Required actions and due dates are routinely monitored in various Duke Energy  
10      management meetings in the CCP organization.

11           As an example, both CAMA and the CCR Rule require the development  
12      of ash basin closure plans. CAMA, however, is more granular in the required  
13      level of detail to be included in the narrative of the proposed closure plan as  
14      compared to the CCR Rule. Conversely, the CCR Rule has a more limiting due  
15      date for development of the ash basin closure plans. Therefore, for sites to which  
16      both the CCR Rule and CAMA are applicable, the less granular closure plans  
17      were developed to meet the CCR Rule's required due date of October 2016, while  
18      more detailed closure plans are separately being developed to meet the exacting  
19      requirements of CAMA by the December 2019 deadline.

20           As discussed above, the CCR Rule requires DE Carolinas to comply with  
21      minimum national criteria, as well as any applicable state laws, in the closure of  
22      ash basins. Thus, the CCR Rule leaves to the states to approve the method of ash  
23      basin closure, as long as such method meets the timeframes and minimum

1 requirements set forth in the CCR Rule. In South Carolina, the method of closure  
2 required under the CCR Rule was selected based on the Consent Agreement.

3 In addition to closure requirements, Duke Energy is complying with the  
4 other CCR Rule requirements at its facilities in South Carolina, including its  
5 groundwater monitoring and corrective action, recordkeeping, notification, and  
6 Internet posting requirements.

7 Again, the Company will complete the most limiting action with respect to  
8 closure method and timeframe.

9 **Q. IS THE COMPANY REQUESTING RECOVERY OF COSTS**  
10 **ASSOCIATED WITH ITS OBLIGATIONS RELATED TO THE 2014 DAN**  
11 **RIVER ASH RELEASE?**

12 A. No. On February 2, 2014, a release of coal ash into the Dan River occurred at the  
13 Dan River Steam Station north of Eden, North Carolina. The Company  
14 responded promptly to the Dan River release to repair plant equipment and  
15 contain the release. The Company also worked with affected communities and  
16 with environmental regulators to assess and address environmental impacts.

17 The Company has isolated costs related to this response and is not  
18 requesting their recovery in this proceeding. We have also established unique  
19 process codes for these costs to ensure they are not included in this case.

1                                    **IV.     DUKE ENERGY'S COMPLIANCE PLANS**

2     **Q.     HOW DO THE REQUIREMENTS UNDER THE CCR RULE, SOUTH**  
3                    **CAROLINA OVERSIGHT, AND CAMA AFFECT THE COMPANY'S**  
4                    **COAL-FIRED PLANTS?**

5     A.     The CCR compliance requirements affect how the coal-fired power plants operate  
6                    and effectively require the coal ash basins to be retired. With regard to ash basin  
7                    operation, modifications to the power plants are required to direct storm water  
8                    flow away from the ash basins and to cease bottom ash and fly ash sluice flow to  
9                    the basins. As the ash basins are closed, other process streams, such as low-  
10                  volume wastewater, coal pile run-off, and FGD blowdown flows, must also be  
11                  directed away from the ash basins to facilitate de-watering and closure. As  
12                  detailed earlier in this testimony, the CCR Rule, South Carolina oversight, and  
13                  CAMA require closure of the ash basins; the timing and approach of these  
14                  closures is dictated by the most limiting regulatory requirement.

15    **Q.     PLEASE DESCRIBE THE COMPANY'S ACTIVITIES UNDERTAKEN**  
16                    **PURSUANT TO ITS COAL ASH REGULATORY OBLIGATIONS.**

17    A.     For each site, preliminary engineering and design work was performed to  
18                    determine the best ash basin closure option for the site as well as permitting  
19                    needs. Ash basin closure requires the removal of all in flows to the basin such as  
20                    sluiced ash, process water, and storm water prior to ash basin closure options of  
21                    excavation, cap in place, and/or beneficiation.

22                    DE Carolinas' approach for closing specific CCR units has evolved over  
23                    time to meet the changing state and federal regulatory landscape. State-specific

1 regulatory obligations, such as the W.S. Lee Consent Agreement and CAMA,  
2 provided additional clarity for developing closure options. Additionally, technical  
3 investigations of groundwater, dam stability, and environmental concerns has  
4 continued to inform the Company's decision-making.

5 For both state and federal regulatory obligations, a ground water  
6 monitoring program has been established. This includes the installation of  
7 numerous ground water wells and well monitoring for at least 30 years following  
8 basin closure.

9 To comply with the federal CCR Rule's mandates on stopping flows to the  
10 ash basins, many sites required modifications to convert to dry ash handling, new  
11 or additional wastewater treatment, and rerouting of storm and process water  
12 handling. These activities are largely complete at the DE Carolinas sites.

13 Once the basin in flows are stopped, the ash basin can then be closed by  
14 excavation, cap in place, and/or beneficiation depending on engineering and  
15 scientific analysis and regulatory requirements. For any of the closure methods,  
16 the basin water must be treated and removed. Site Closure Plans and Site  
17 Analysis and Removal Plans have been developed for each site and are attached  
18 to my testimony as Kerin Exhibit 9. Kerin Exhibit 8 provides illustrations of the  
19 technical approaches to the excavation and cap-in-place closure methods.

1   **Q.   HAS THE REASONABLENESS AND PRUDENCY OF THE CLOSURE**  
2       **OPTIONS THAT THE COMPANY HAS SELECTED FOR EACH SITE**  
3       **BEEN FULLY EVALUATED AND SCRUTINIZED IN A PRIOR RATE**  
4       **PROCEEDING?**

5   A.   Yes. As I mentioned earlier, I testified on behalf of DE Carolinas in its North  
6       Carolina rate case that was filed in 2017. Certain intervenors to the case hired  
7       engineering consultants to review and critique the Company's decision-making  
8       with regard to its selected CCR compliance options. The North Carolina Utilities  
9       Commission held that DE Carolinas' selected closure options were reasonable and  
10      prudent, with only limited exceptions. As an appendix to my testimony, I am  
11      providing site-by-site summaries of each DE Carolinas site, which include  
12      historical background, an explanation of the Company's selected closure option,  
13      and an overview of the issues raised and decided in the North Carolina rate case.  
14      *See Kerin Appendix.*

15   **Q.   PLEASE PROVIDE THE COMPLIANCE COSTS RELATED TO ASH**  
16       **POND CLOSURE REQUESTED FOR RECOVERY IN THIS CASE.**

17   A.   DE Carolinas reasonably and prudently incurred and expects to incur a total of  
18       \$958 million (on a system basis) related to incremental ash pond closure  
19       compliance costs from January 2015 through December 2018. Company Witness  
20       Smith describes the calculation of and the recovery requested related to this  
21       deferred balance. These current and expected compliance activities are  
22       reasonable, prudent, and cost-effective solutions given the individual  
23       characteristics of each CCR plant and basin site.

1   **Q.   HAS THE COMPANY IDENTIFIED ANY COSTS THAT IT WILL NOT BE**  
2   **SEEKING FROM SOUTH CAROLINA CUSTOMERS?**

3   A.   Yes. The Company will not be seeking from South Carolina customers certain  
4   costs that are associated with the provision of drinking water to North Carolina  
5   residents. These costs include the provision of bottled water and permanent  
6   drinking water supplies, *e.g.*, connection to a public water supply or filtration  
7   systems. The Company has decided to absorb the share of these costs that the  
8   North Carolina Utilities Commission ordered should be allocated to South  
9   Carolina.

10  **Q.   HOW, IF AT ALL, DO THE COMPANY'S HISTORICAL CCR**  
11  **PRACTICES IMPACT THE COMPLIANCE COSTS THAT DE**  
12  **CAROLINAS IS SEEKING IN THIS PROCEEDING?**

13  A.   They do not affect them at all. I make clear in prior sections of my testimony that  
14  DE Carolinas' historical handling of CCRs was reasonable, prudent, and  
15  consistent with industry standards over time. These facts are important to show  
16  that nothing that DE Carolinas has done historically is causing the Company to  
17  incur any unjustified costs today to comply with coal ash regulatory requirements.

18  **Q.   REGARDING THE ASH POND CLOSURE COSTS ALREADY**  
19  **INCURRED OR EXPECTED TO BE INCURRED PRIOR TO DECEMBER**  
20  **2018, WHAT DO THOSE COSTS COMPRISE AND WHY ARE THEY**  
21  **REASONABLE AND PRUDENT COSTS?**

22  A.   In Kerin Exhibit 10, I have broken these costs down into their core components  
23  and have described the plants to which these costs apply. In detailing these costs,

1 I have also provided narrative summaries as to why these costs were incurred and  
2 why the compliance actions that led to those costs were the most reasonable and  
3 cost-effective options given the applicable facts and circumstances. This exhibit,  
4 coupled with the balance of my testimony and exhibits, demonstrate that these  
5 costs are reasonable and prudent.

6 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

7 A. Yes.